WHAT IS CLAIMED IS:

1. A throttle valve control apparatus comprising:

a deviation calculating unit which calculates a deviation between a target opening and an actual opening of a throttle valve;

a reference unit which outputs a control coefficient for the individual deviation;

a temporarily determining unit which refers to the reference unit at a predetermined interval so as to temporarily determine a temporary control coefficient corresponding to the deviation;

a coefficient limiting unit which determines an actual control coefficient for a present period based on comparing the temporary control coefficient temporarily determined by the temporarily determining unit, with a stored actual control coefficient determined for a previous period;

a present value storing unit which stores the actual control coefficient determined by the coefficient limiting unit; and

a drive signal determining unit which determines a drive signal for the throttle valve based on the actual control coefficient obtained from the coefficient limiting unit and the deviation obtained from the deviation calculating unit,

wherein the coefficient limiting unit has a permissible change predetermined for the change of the control coefficient which changes for a single period, obtains a difference as a change between the temporary control coefficient temporarily determined by the temporarily determining unit and the actual control coefficient for the previous period stored in the present value storing unit at predetermined periods, and limits the obtained change according to the permissible change so as to determine the actual control coefficient for the present period, thereby fitting the change from the actual control coefficient for the previous period to the actual control coefficient for the present period into the permissible change.

2. The throttle valve control apparatus according to claim 1, wherein the drive signal determining unit determines the drive signal by use of a product obtained by multiplying the deviation by the actual control coefficient.

3. The throttle valve control apparatus according to claim 1, wherein the drive signal determining unit determines the drive signal by use of an integral of product obtained by multiplying the deviation by the actual control coefficient.

4. The throttle valve control apparatus according to claim 1, wherein the coefficient limiting unit has a permissible increment used in case for increasing the control coefficient and a permissible decrement used in case for decreasing the control coefficient respectively as the permissible change, uses the permissible increment as the permissible change when the temporary control coefficient temporarily determined by the temporarily determining unit is larger than the actual control coefficient for the previous period stored in the present value storing unit, and uses the permissible decrement as the permissible change when the temporary control coefficient temporarily determined by the temporarily determining unit is smaller than the actual control coefficient for the previous period stored in the present value storing unit, thereby determining the actual control coefficient for the present period.

5. A throttle valve control apparatus comprising:

a deviation calculating unit which calculates a deviation between a target opening and an actual opening of a throttle valve;

a reference unit which outputs a control coefficient for the individual deviation;

a temporarily determining unit which refers to the reference unit at a predetermined interval so as to temporarily determine a temporary control coefficient corresponding to the deviation; and

a drive signal determining unit which determines a drive signal for the throttle valve based on the temporary control coefficient obtained from the temporarily determining unit and the deviation obtained from the deviation calculating unit,

the apparatus further comprising:

a time function generating unit which outputs as a function of an elapsed time starting from a moment when the deviation exceeds a predetermined deviation threshold, upper and lower limits of the control coefficient for the individual elapsed time;

an upper/lower limit determining unit which has a function of starting measuring the elapsed time when the deviation exceeds the predetermined deviation threshold, and refers to the time function generating unit at a predetermined interval to determine the upper and lower limits of the control coefficient corresponding to the elapsed time; and

a coefficient limiting unit which applies the upper and lower limits obtained from the upper/lower limit determining unit to the temporary control coefficient temporarily determined by the temporarily determining unit at predetermined periods, thereby determining the actual control coefficient for a present period,

wherein the drive signal determining unit determines the drive signal for the throttle valve based on the actual control coefficient obtained from the coefficient limiting unit and the deviation obtained from the deviation calculating unit.

6. A throttle valve control apparatus comprising:

a deviation calculating unit which calculates a deviation between a target opening and an actual opening of a throttle valve;

a reference unit which outputs a control coefficient for the individual deviation;

a temporarily determining unit which refers to the reference unit at a predetermined interval so as to temporarily determine a temporary control coefficient corresponding to the deviation; and

a drive signal determining unit which determines a drive signal for the throttle valve based on the temporary control coefficient obtained from the temporarily determining unit and the deviation obtained from the deviation calculating unit,

the apparatus further comprising:

a stroke number function generating unit which outputs as a stroke number function of a number of strokes in the engine corresponding to the integral of the number of revolutions in the engine, upper and lower limits of the control coefficient for the individual stroke number;

an upper/lower limit determining unit which has a function of starting measuring the number of strokes in the engine corresponding to the integral of the number of revolutions in the engine when the deviation exceeds a predetermined deviation threshold, and refers to the stroke number function generating unit at a predetermined interval to determine the upper and lower limits of the control coefficient corresponding to the number of strokes in the engine; and

a coefficient limiting unit which applies the upper and lower limits obtained from the upper/lower limit determining unit to the temporary control coefficient temporarily determined by the temporarily determining unit at predetermined periods, thereby determining the actual control coefficient for a present period,

wherein the drive signal determining unit determines the drive signal for the throttle valve based on the actual control coefficient obtained from the coefficient limiting unit and the deviation obtained from the deviation calculating unit.